WORDS AND NUMBERS.

A

LESSON-BOOK

FOR PRIMARY SCHOOLS.

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LESSON-BOOK

FOR

PRIMARY SCHOOLS.

BY

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"The Beginning is Half the Whole."

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PREFACE.

This manual was originally prepared for the primary schools at one time under the author's supervision, and was used in them for two or three years in manuscript. At the request of teachers who have used it, and of school-officers who have examined it and seen something of the method and the results of its use, it is published.

It is designed for the second year in the primary school, that is, for children who have read a Primer or First Reader; and, with the exception of a Reader, is the only book they will need in school that year. On each page the work for one week is prescribed. This consists of: —

1. A motto or sentiment to be learned and recited. This also serves as the copy for writing-lessons through the week.

2. Four short spelling-lessons. These are not always of short words, but always of words with which the children are familiar, or which they have occasion to use.

3. Tables in addition, subtraction, multiplication, or division.

4. A large number of carefully graded examples for slate-work in the fundamental operations of arithmetic.

5. Four topics for oral lessons on behavior, morals, hygiene, plants, animals, points of the compass, place, geography, measures, or natural phenomena.

A few pages of hints, suggestions, and models for oral lessons, have been added for the benefit of those teachers who have had but little experience, and little or no special preparation for their work. If any such, upon whom so often the tremendous responsibility of training little children is laid, shall be helped by this book to a better apprehension and performance of their important duties, the object for which it was prepared will be attained.

CONNECTICUT NORMAL SCHOOL,
1879.

DIRECTIONS TO TEACHERS.

1. At the beginning of each week explain and illustrate the motto and see that the pupils commit it to memory. Require them, singly or in concert, to repeat it every day. It will be well to relate each day some anecdote or incident illustrating the application of the motto to daily life. As you advance require the mottoes of previous weeks to be recited as reviews.

2. The pupils are to copy the motto on slates each day, from three to ten times, according to circumstances. From the very outset script forms are to be used, and the forms given in the book must be carefully copied. Before requiring pupils to write a word or a letter show them just how to do it, that is, where to begin, and in what direction to make each mark. Pursue the same course with regard to figures, punctuation-marks, and drawing.

See that the pupils hold their pencils properly, and that their bodies, heads, arms, and slates are in correct position. This is very important, as the habits formed now will influence the whole life.

The pencils should be sharp, and the slates ruled with fine permanent lines drawn with a sharp steel point. One side of the slate should be covered with such lines drawn in pairs, five millimeters (three-sixteenths of an inch) apart. The distance between one pair and the next should be two centimeters (three-fourths of an inch).

3. Each column of five words is the spelling-lesson for one day. Do not assign more than this for an advance lesson.

The last lesson of each week is to be a review of the four preceding lessons. Try to secure the thorough learning of each lesson, and to make it permanent by frequent reviews, extending as far back as practicable. Advance slowly and thoroughly; review constantly and abundantly. Have some written spelling every day, even if not more than one or two words at first.

4. If the tables to be learned do not furnish work enough of this kind for the week fill up the time with reviews of those previously learned, varying the manner of recitation to keep up the interest. It is only by much repetition that such things are fastened in the minds of most children.

5. Do not give rules for the slate-work, but show the children how to do it, and then let them learn by practice. If necessary give additional examples, but do not make them more difficult than those in the book.

6. Do not neglect the oral lessons. These, more than any other part of the work, will tax your resources and ingenuity. The suggestions and models in the last part of the book will be of service in indicating methods of procedure and sources of information.

The lessons are arranged on the supposition that the book will be begun by classes about the first of September. If it should be taken up first at the beginning of a spring or winter term some of the lessons on plants, holidays, and phenomena of the seasons would properly be given out of the order in which they are placed, so as to bring them at the appropriate time in the year.

FIRST WEEK.

I will try.

I will try.

1	2	3	4
school	book	table	four
teacher	slate	scholars	five
scholar	desk	desks	six
one	chair	three	seven
two	ruler	study	figure

COPY AND READ

1 2 3 4 5 6 7

ORAL LESSONS.

1. The school: order, punctuality, positions, movements.
   Review the development of numbers to three.
2. This book: parts, care, how to use.
   Development of numbers to four.
3. Behavior towards teachers in school, out of school.
   Development of numbers to five.
4. Orderly arrangement of books, playthings, and other articles.
   Development of numbers to six.
5. Review of such of the lessons as most need it.

SECOND WEEK.

I will do my best.

I will do my best.

1	2	3	4
pencil	eight	spell	lesson
pointer	nine	ten	platform
crayon	learn	eleven	blackboard
order	recite	reading	eraser
number	read	spelling	twelve

COPY AND READ

5 6 7 8 9 10 11 12

ORAL LESSONS.

1. Truthfulness : what it is, and its importance.
   Development of numbers to seven.
2. Care of books, slates, and furniture.
   Development of numbers to eight.
3. How to tell time by the clock.
   Development of numbers to nine.
4. Behavior on the street.
   Development of numbers to ten.
5. Review.

THIRD WEEK.

Do as you would be done by.

Do as you would be done by.

1	2	3	4
write	plant	bud	tree
writing	root	flower	bush
pen	stem	seed	herb
paper	branch	bark	shrub
knife	twig	wood	grass

TABLES TO BE LEARNED.

1	and	0	are	1	1	from	1	leaves	0
1	and	1	are	2	1	from	2	leaves	1
1	and	2	are	3	1	from	3	leaves	2
1	and	3	are	4	1	from	4	leaves	3
1	and	4	are	5	1	from	5	leaves	4

EXAMPLES FOR SLATE WORK.

	1	*2*	*3*	*4*	*5*		*1*	*2*	*3*	*4*	*5*
Add	2	1	1	0	3	From	1	5	4	3	2
and	1	4	1	1	1	take	1	1	1	1	1
	—	—	—	—	—		—	—	—	—	—

ORAL LESSONS.

1. Treatment of schoolmates; the Golden Rule.
2. Plants: parts named and distinguished.
3. Plants distinguished as herbs, shrubs, or trees.
4. Cardinal points, how found; sunrise and sunset.
5. Review.

FOURTH WEEK.

Obey your parents.

Obey your parents.

1	2	3	4
father	leaf	point	sunrise
mother	petiole	east	morning
parent	base	west	sunset
parents	blade	north	evening
obey	apex	south	night

TABLES.

0	and	1	are	1	1	less	1	is	0
1	and	1	are	2	2	less	1	is	1
2	and	1	are	3	3	less	1	is	2
3	and	1	are	4	4	less	1	is	3
4	and	1	are	5	5	less	1	is	4

SLATE WORK.

	1	*2*	*3*	*4*	*5*		*1*	*2*	*3*	*4*	*5*
Add	3	1	4	1	2	From	3	4	1	5	2
and	1	2	1	3	1	take	2	3	1	4	1

ORAL LESSONS.

1. Meaning and methods of honoring parents.
2. Leaves: parts and common forms.
3. Leaves: veins, and their different arrangements.
4. Semi-cardinal points.

FIFTH WEEK.

A place for every thing.

A place for every thing.

1	2	3	4
right	stalk	toothed	seeds
left	leaves	notched	pulp
before	margin	apple	blossom
behind	entire	skin	green
around	wavy	core	ripe

TABLES.

2	and	0	are	2	2	from	2	leaves	0
2	and	1	are	3	2	from	3	leaves	1
2	and	2	are	4	2	from	4	leaves	2
2	and	3	are	5	2	from	5	leaves	3
2	and	4	are	6	2	from	6	leaves	4

SLATE WORK.

	1	*2*	*3*	*4*	*5*		*1*	*2*	*3*	*4*	*5*
Add	3	4	2	1	2	From	2	4	3	6	5
and	2	2	3	2	4	take	2	2	2	2	2

ORAL LESSONS.

1. Advantages of system and order.
2. Leaves: varieties of margin.
3. The apple: parts, uses; should not be eaten green.
4. Relative positions, as right, left, above, under, etc.

SIXTH WEEK.

Every thing in its place.

Every thing in its place.

1	2	3	4
fruit	cherries	above	sing
stone	plum	below	scale
peach	red	beside	staff
peaches	blue	under	note
cherry	yellow	between	bar

TABLES.

0	and	2	are	2	2	less	2	is	0
1	and	2	are	3	3	less	2	is	1
2	and	2	are	4	4	less	2	is	2
3	and	2	are	5	5	less	2	is	3
4	and	2	are	6	6	less	2	is	4

SLATE WORK.

	1	*2*	*3*	*4*	*5*		*1*	*2*	*3*	*4*	*5*
Add	3	4	1	2	2	From	6	5	6	5	4
and	1	2	5	3	2	take	4	2	2	3	2

ORAL LESSONS.

1. Illustrate and enforce the motto.
2. Structure of stone-fruits.
3. Apple and peach: how like, and how unlike.
4. Personal cleanliness: why desirable; how secured.

SEVENTH WEEK.

Thou shalt not steal.

Thou shalt not steal.

1	2	3	4
steal	nut	walnut	tooth
rob	shell	chestnut	teeth
hurt	meat	acorn	bite
injure	burr	filbert	chew
destroy	shuck	almond	speak

TABLES.

3	and	0	are	3	3	from	3	leaves	0
3	and	1	are	4	3	from	4	leaves	1
3	and	2	are	5	3	from	5	leaves	2
3	and	3	are	6	3	from	6	leaves	3
3	and	4	are	7	3	from	7	leaves	4

SLATE WORK.

	1	*2*	*3*	*4*	*5*		*1*	*2*	*3*	*4*	*5*
Add	3	4	3	3	2	From	6	5	7	5	7
and	2	3	3	4	3	take	3	2	3	3	4

ORAL LESSONS.

1. Right of property: how it may be violated.
2. Nuts: names and uses of different parts.
3. Nuts and stone-fruits compared.
4. The teeth: number, growth, loss, care.

EIGHTH WEEK.

Health is better than wealth.

Health is better than wealth.

1	2	3	4
health	corn	potato	bell
wealth	wheat	turnip	brush
riches	rye	beans	tumbler
good	oats	squash	map
better	barley	pumpkin	picture

TABLES.

0	and	3	are	3	3	less	3	is	0
1	and	3	are	4	4	less	3	is	1
2	and	3	are	5	5	less	3	is	2
3	and	3	are	6	6	less	3	is	3
3	and	4	are	7	7	less	3	is	4

SLATE WORK.

	1	*2*	*3*	*4*	*5*		*1*	*2*	*3*	*4*	*5*
Add	4	2	5	2	3	From	7	5	4	7	6
and	3	2	1	3	4	take	4	3	2	3	3

ORAL LESSONS.

1. Explain and illustrate the motto.
2. Plants furnishing food.
3. Importance of regularity and deliberation in eating.
4. Study of some object with reference to form, parts, material, and obvious qualities.

NINTH WEEK.

Speak, act, think the truth.

Speak, act, think the truth.

1	2	3	4
lie	grain	grind	subtract
cheat	berry	parch	plus
deceive	pod	roast	minus
action	kernel	add	equals
think	husk	count	thirteen

TABLES.

4	and	0	are	4		4	less	4	is	0
4	and	1	are	5		5	less	4	is	1
4	and	2	are	6		6	less	4	is	2
4	and	3	are	7		7	less	4	is	3
4	and	4	are	8		8	less	4	is	4

SLATE WORK.

Add	3	4	3	4	3	2	4	2	2	1
and	2	4	4	2	3	4	1	3	2	4
From	4	8	6	5	7	5	4	8	7	6
take	1	4	2	3	4	1	0	4	3	4

ORAL LESSONS.

1. Explain and illustrate the motto: acting lies.
2. Object-lesson on different kinds of fruits and seeds.
3. The nails: use, growth, care.
4. Name and use of +, −, and =.

TENTH WEEK.

Blessed are the meek.

Blessed are the meek.

1	2	3	4
spiteful	door	floor	fourteen
proud	window	multiply	fifteen
angry	wall	divide	cipher
wrong	ceiling	product	adding
wicked	room	quotient	sign

TABLES.

5	+	0	=	5		5	−	5	=	0
5	+	1	=	6		6	−	5	=	1
5	+	2	=	7		7	−	5	=	2
5	+	3	=	8		8	−	5	=	3
5	+	4	=	9		9	−	5	=	4
5	+	5	=	10		10	−	5	=	5

SLATE WORK.

Add	2	3	4	5	1	2	3	4	5	3
and	1	4	3	2	5	3	1	2	1	3
and	3	1	2	3	3	4	4	3	2	3
From	10	9	6	7	9	8	7	8	7	6
take	5	4	5	3	5	4	5	3	4	1

ORAL LESSONS.

1. Revenge: what it is; why wrong; better way.
2. Boundaries of the schoolroom, with map.
3. Multiplication taught by means of objects.
4. Division taught by means of objects.

ELEVENTH WEEK.

I must be punctual.

1	2	3	4
early	day	once	church
punctual	noon	twice	pew
late	breakfast	times	pulpit
tardy	dinner	sixteen	altar
truant	supper	seventeen	aisle

TABLES.

2	nothings	are	0	0	is	no	twos.
2	ones	are	2	2	is	1	two.
2	twos	are	4	4	is	2	twos.
2	threes	are	6	6	is	3	twos.
2	fours	are	8	8	is	4	twos.
2	fives	are	10	10	is	5	twos.

SLATE WORK.

Multiply by	3 × 2	5 × 2	1 × 2	4 × 2	2 × 2	0 × 2	5 × 2

Add and	5 + 4	3 + 5	4 + 4	5 + 5	From take	10 − 5	8 − 3	9 − 5	9 − 4	8 − 5

ORAL LESSONS.

1. Evils of tardiness in business and in school.
2. Boundaries and map of the school-yard.
3. How to use public property.
4. Behavior in church.

TWELFTH WEEK.

Blessed are the pure in heart.

1	2	3	4
pure	uncle	points	hyphen
clean	aunt	marks	interrogation
sweet	cousin	comma	exclamation
white	nephew	period	semicolon
loving	niece	colon	dash

TABLES.

6	+	0	=	6		6	−	6	=	0
6	+	1	=	7		7	−	6	=	1
6	+	2	=	8		8	−	6	=	2
6	+	3	=	9		9	−	6	=	3
6	+	4	=	10		10	−	6	=	4
6	+	5	=	11		11	−	6	=	5

SLATE WORK.

Add	6	4	5	2	1	3	2	3	4	1
and	2	5	3	4	6	5	2	4	4	5
and	2	1	3	5	4	1	2	3	1	5
From	9	10	8	10	11	9	11	10	9	8
take	3	6	5	4	5	4	6	5	6	3

ORAL LESSONS.

1. Meanness and wickedness of profanity and obscenity.
2. Map of school-yard and adjoining streets.
3. Use of ., —, ?. Names of other points.
4. Name and use of ×.

THIRTEENTH WEEK.

Think before you speak.

1	2	3	4
Annie	stove	hair	gray
Henry	register	black	auburn
Thomas	ventilator	brown	December
recess	Monday	singing	comb
wardrobe	Tuesday	playing	vacation

TABLES.

3	× 0	=	0	0	is	no	threes.
3	× 1	=	3	3	is	1	three.
3	× 2	=	6	6	is	2	threes.
3	× 3	=	9	9	is	3	threes.
3	× 4	=	12	12	is	4	threes.
3	× 5	=	15	15	is	5	threes.

SLATE WORK.

Multiply	4	5	3	2	5	4	3	1	3	3
by	3	2	5	4	3	2	2	3	3	4

Add	6	4	5	5	6	From	11	10	11	9	8
and	5	6	5	6	4	take	5	6	6	4	5

ORAL LESSONS.

1. School arrangements and duties.
2. Origin and meaning of Thanksgiving Day.
3. The hair: uses, colors, growth, loss, care.
4. Care of health in play.

FOURTEENTH WEEK.

Doing nothing is doing ill.

1	2	3	4
idle	name	clock	Thursday
lazy	Mary	face	Friday
busy	Lucy	hands	Saturday
happy	John	pendulum	week
indolent	James	Wednesday	Sunday

TABLES.

7	+	0	=	7		7	−	7	=	0
7	+	1	=	8		8	−	7	=	1
7	+	2	=	9		9	−	7	=	2
7	+	3	=	10		10	−	7	=	3
7	+	4	=	11		11	−	7	=	4
7	+	5	=	12		12	−	7	=	5

SLATE WORK.

Add	5	4	2	7	6	2	4	5	1	3
and	3	5	3	1	4	7	3	1	7	3
and	4	2	7	3	1	2	4	3	2	5
From	11	9	11	10	9	11	12	11	12	10
take	6	5	4	5	4	7	5	5	7	6

ORAL LESSONS.

1. Industry and idleness contrasted.
2. Capitals at beginning of sentences and of proper names.
3. How to tell time by the clock.
4. Boundaries of the town, with map.

FIFTEENTH WEEK.

Sands form mountains.

1	2	3	4
little	snow	cover	town
small	flake	protect	river
trifle	crystal	earth	city
trifling	form	ground	state
minute	regular	sleigh	capital

TABLES.

4	×	0	=	0	4	in	0	no time.
4	×	1	=	4	4	in	4	once.
4	×	2	=	8	4	in	8	twice.
4	×	3	=	12	4	in	12	3 times.
4	×	4	=	16	4	in	16	4 times.
4	×	5	=	20	4	in	20	5 times.

SLATE WORK.

Multiply	4	5	4	3	5	4	3	5	1	0
by	4	3	5	4	4	3	5	2	5	4
Add	7	4	6	5	5	From	12	11	12	11	12
and	5	7	5	7	5	take	5	4	7	6	6

ORAL LESSONS.

1. Illustrate the importance of little things.
2. Forms of crystals in snow-flakes.
3. Uses of snow.
4. Boundaries, capital, principal rivers of the State.

SIXTEENTH WEEK.

On earth peace, good will.

1	2	3	4
peace	manger	seasons	year
flocks	Christmas	spring	shadow
sheep	shepherds	summer	eighteen
feast	festival	autumn	nineteen
angels	Bethlehem	winter	twenty

TABLES.

8	+	0	=	8		8	−	8	= 0
8	+	1	=	9		9	−	8	= 1
8	+	2	=	10		10	−	8	= 2
8	+	3	=	11		11	−	8	= 3
8	+	4	=	12		12	−	8	= 4
8	+	5	=	13		13	−	8	= 5

SLATE WORK.

Add	4	5	3	5	6	2	3	4	4	3
and	4	6	3	3	2	5	3	3	4	5
and	3	2	4	5	4	3	3	4	4	3
From	13	12	13	11	12	11	12	10	12	9
take	8	5	5	3	7	8	4	6	8	4

ORAL LESSONS.

1. The story of Christmas.
2. Counties in the State.
3. Length of day; length of shadow at noon.
4. Name and use of ÷.

SEVENTEENTH WEEK.

Swear not at all.

1	2	3	4
swear	January	county	long
profane	February	counties	division
curse	month	city	divisor
cursing	months	answer	dividend
strike	cold	result	short

TABLES.

5	×	0	=	0		0	÷	5	=	0
5	×	1	=	5		5	÷	5	=	1
5	×	2	=	10		10	÷	5	=	2
5	×	3	=	15		15	÷	5	=	3
5	×	4	=	20		20	÷	5	=	4
5	×	5	=	25		25	÷	5	=	5

SLATE WORK.

Multiply	5	3	5	4	4	3	4	5	0	3
by	4	5	5	3	5	3	4	2	5	4
Add	8	7	8	4	3	4	5	7	6	8
and	5	4	3	8	7	6	8	5	3	0
From	13	12	13	11	11	10	12	10	12	9
take	8	4	5	6	4	5	8	7	7	9

ORAL LESSONS.

1. Explain and enforce the motto.
2. New-Year's Day; days in a year; the seasons.
3. Towns in the county, arranged alphabetically.
4. Teach "long division," using numbers from the tables only.

EIGHTEENTH WEEK.

Render good for evil.

1	2	3	4
sled	eye	lid	harness
coast	eyes	lash	runners
slide	pupil	brow	shafts
sliding	iris	wink	seat
skate	ball	shut	dasher

TABLES.

9	+	0	=	9			9	−	9	=	0
9	+	1	=	10			10	−	9	=	1
9	+	2	=	11			11	−	9	=	2
9	+	3	=	12			12	−	9	=	3
9	+	4	=	13			13	−	9	=	4
9	+	5	=	14			14	−	9	=	5

SLATE WORK.

Add	5	3	6	4	2	7	1	3	5	8
and	3	7	1	2	8	2	5	7	4	2
and	4	1	6	7	3	2	4	4	5	4
From	14	12	13	14	11	14	13	10	12	14
take	9	6	4	5	3	4	8	4	8	10

3)12(5)15(3)9(4)20(

ORAL LESSONS.

1. Explain and enforce the motto.
2. The eyes: parts, use, care.
3. How to walk: not heavily; not on the toes.
4. Snow-huts of the Esquimaux.

NINETEENTH WEEK.

Wisdom is better than riches.

1	2	3	4
wise	street	mouth	hard
rich	house	nose	soft
learning	hit	lungs	sap
knowledge	break	throat	heart
wisdom	frighten	breathe	pith

TABLES.

6	×	0	=	0		0	÷	6	= 0
6	×	1	=	6		6	÷	6	= 1
6	×	2	=	12		12	÷	6	= 2
6	×	3	=	18		18	÷	6	= 3
6	×	4	=	24		24	÷	6	= 4
6	×	5	=	30		30	÷	6	= 5

SLATE WORK.

Multiply	6	5	6	4	6	3	5	6	4	6
by	1	6	4	5	3	5	4	5	2	2
Add	9	5	8	4	7	6	9	3	5	4
and	4	9	5	9	5	6	3	8	8	7
From	14	8	11	10	13	9	12	7	14	6
take	5	4	8	1	9	9	3	0	9	3

ORAL LESSONS.

1. Why snowballing in the streets is improper.
2. Why the lips should be closed when out of doors.
3. How to turn out when meeting people.
4. Structure of wood: sap, heart, pith, bark.

TWENTIETH WEEK.

Kind words do much good.

1	2	3	4
horse	tattle	kind	foot
cow	tattling	kindness	feet
dog	whisper	cruel	shoes
cat	whispering	cruelty	boots
kitten	mischief	truth	socks

TABLES.

10	+	0	=	10		10	−	10	=	0
10	+	1	=	11		11	−	10	=	1
10	+	2	=	12		12	−	10	=	2
10	+	3	=	13		13	−	10	=	3
10	+	4	=	14		14	−	10	=	4
10	+	5	=	15		15	−	10	=	5

SLATE WORK.

Add	3	5	4	6	2	4	6	5	7	3
and	5	5	2	4	5	4	1	2	3	3
and	4	5	6	2	4	4	2	2	1	3
From	15	12	14	11	13	10	13	11	14	12
take	10	2	4	10	3	9	10	1	10	10

4)12(5)20(4)16(6)12(6)30(

ORAL LESSONS.

1. Kindness to animals.
2. Telling tales: what it is; why wrong.
3. Lesson on some animal named above.
4. Danger of sitting with wet feet.

TWENTY-FIRST WEEK.

What I do, I will do well.

1	2	3	4
place	line	rain	parallel
here	straight	hail	inclined
there	curved	frost	up
where	broken	ice	down
yonder	direction	icy	perpendicular

TABLES.

7	×	0	=	0		0	÷	7	=	0
7	×	1	=	7		7	÷	7	=	1
7	×	2	=	14		14	÷	7	=	2
7	×	3	=	21		21	÷	7	=	3
7	×	4	=	28		28	÷	7	=	4
7	×	5	=	35		35	÷	7	=	5

SLATE WORK.

Multiply	7	5	6	4	7	3	6	5	7	6
by	1	7	5	7	2	7	4	4	3	2

Add	9	6	8	5	7	From	14	12	15	13	11
and	4	5	3	9	4	take	9	9	10	8	7

6)24 (7)35 (6)18 (7)28 (7)14 (

ORAL LESSONS.

1. Explain and enforce the motto.
2. Kinds of lines: straight, curved, broken.
3. Wood and bark compared.
4. Relation of lines: parallel, inclined, perpendicular.

TWENTY-SECOND WEEK.

It is mean to cheat.

1	2	3	4
honesty	horizontal	pine	angle
honest	vertical	oak	opening
dishonest	oblique	elm	equal
dishonesty	slanting	maple	corner
cheating	horizon	cedar	incline

TABLES.

11	+	0	=	11		11	−	11	= 0
11	+	1	=	12		12	−	11	= 1
11	+	2	=	13		13	−	11	= 2
11	+	3	=	14		14	−	11	= 3
11	+	4	=	15		15	−	11	= 4
11	+	5	=	16		16	−	11	= 5

SLATE WORK.

Add	3	5	4	2	1	3	2	5	1	4
and	5	6	8	1	5	2	7	4	3	4
and	4	3	2	9	6	9	4	6	8	7
From	13	16	12	14	11	15	16	10	12	15
take	11	11	10	3	9	11	5	7	9	4

ORAL LESSONS.

1. Lesson on honesty.
2. Positions of lines: vertical, horizontal, oblique.
3. Two or more kinds of wood compared.
4. Definition of angle, and of right angle.

TWENTY-THIRD WEEK.

Well begun is half done.

1	2	3	4
begin	acute	fir	triangle
begun	obtuse	spruce	linden
beginning	blunt	hemlock	larch
do	doing	birch	beech
done	sharp	hickory	ash

TABLES.

8	×	0	=	0		0	÷	8	=	0
8	×	1	=	8		8	÷	8	=	1
8	×	2	=	16		16	÷	8	=	2
8	×	3	=	24		24	÷	8	=	3
8	×	4	=	32		32	÷	8	=	4
8	×	5	=	40		40	÷	8	=	5

SLATE WORK.

Multiply	8	4	6	3	7	5	8	7	5	6
by	2	8	2	8	4	8	4	5	5	4

Add	9	11	6	5	4	From	16	15	12	10	14
and	5	4	6	11	10	take	5	11	3	7	8

6)30(5)20(7)21(4)28(7)14(

ORAL LESSONS.

1. Importance of beginning right in any work.
2. Definition of acute angle; of obtuse angle.
3. Kinds of wood and their uses.
4. Definition of triangle; of equilateral triangle.

TWENTY-FOURTH WEEK.

He who does his best does well.

1	2	3	4
trees	boards	joists	square
fuel	planks	shingles	rectangle
timber	beams	clapboards	scalene
lumber	posts	laths	unequal
dyestuff	braces	furniture	lame

TABLES.

12	+	0	=	12	12	−	12	=	0
12	+	1	=	13	13	−	12	=	1
12	+	2	=	14	14	−	12	=	2
12	+	3	=	15	15	−	12	=	3
12	+	4	=	16	16	−	12	=	4
12	+	5	=	17	17	−	12	=	5.

SLATE WORK.

Add	3	5	2	4	3	1	5	2	4	3
and	6	5	7	8	3	2	3	5	4	7
and	6	5	5	4	9	10	8	7	8	3
From	16	14	17	15	16	17	13	11	15	12
take	12	2	5	12	4	12	1	9	3	12

7)28 (2)14 (3)18 (5)15 (3)21 (

ORAL LESSONS.

1. Regard for the rights of all persons.
2. Isosceles and scalene triangles.
3. Lesson on direction: cardinal and semi-cardinal points.
4. Quadrilateral, square, and rectangle.

TWENTY-FIFTH WEEK.

Dare to do right.

1	2	3	4
brave	thirty	noise	loud
bold	forty	harsh	pleasant
dare	fifty	rough	gentle
courage	March	music	George
coward	April	smooth	William

TABLES.

9	×	0	=	0		0	÷	9	=	0
9	×	1	=	9		9	÷	9	=	1
9	×	2	=	18		18	÷	9	=	2
9	×	3	=	27		27	÷	9	=	3
9	×	4	=	36		36	÷	9	=	4
9	×	5	=	45		45	÷	9	=	5

SLATE WORK.

Multiply	4	9	5	9	3	9	8	7	6	7
by	9	4	9	5	7	3	5	4	4	5
Add	11	4	5	8	12	From	15	17	16	14	17
and	5	12	9	3	5	take	11	12	11	10	14

8)40 (7)35 (8)32 (5)40 (8)32 (

9)18 (5)45 (9)36 (3)27 (9)45 (

ORAL LESSONS.

1. Meaning of courage, physical and moral.
2. Parallelogram and rhombus.
3. Sounds: difference between noise and musical tone.
4. Trapezoid and trapezium.

TWENTY-SIXTH WEEK.

A stitch in time saves nine.

1	2	3	4
stitch	hem	hum	circle
sew	needle	buzz	ellipse
mend	thread	ring	rhombus
patch	wax	rattle	thimble
darn	scissors	jingle	cloth

TABLES.

6	+	6	=	12		12	−	6	=	6
6	+	7	=	13		13	−	6	=	7
6	+	8	=	14		14	−	6	=	8
6	+	9	=	15		15	−	6	=	9
6	+	10	=	16		16	−	6	=	10

SLATE WORK.

Add	6	5	3	4	6	2	3	1	5	4
and	3	4	5	7	4	8	7	2	5	4
and	2	6	5	3	5	2	2	8	5	4
From	12	14	13	15	16	14	12	15	11	16
take	6	8	6	9	10	6	7	6	5	6
Multiply	3	9	7	6	9	8	4	5	7	9
by	7	4	5	4	5	2	6	9	4	3

ORAL LESSONS.

1. Explain and illustrate the motto.
2. Pentagon and hexagon.
3. Sounds differing in quality and name.
4. Circle and ellipse.

TWENTY-SEVENTH WEEK.

Order is Heaven's first law.

1	2	3	4
confusion	quiet	spherical	egg
system	waste	hemisphere	oval
disorder	cube	pyramid	round
careful	sphere	figures	cone
careless	globe	numbers	pointed

TABLES.

10	×	0	=	0		0	÷	10	=	0
10	×	1	=	10		10	÷	10	=	1
10	×	2	=	20		20	÷	10	=	2
10	×	3	=	30		30	÷	10	=	3
10	×	4	=	40		40	÷	10	=	4
10	×	5	=	50		50	÷	10	=	5

SLATE WORK.

Multiply	10	8	6	9	7	10	5	6	9	3
by	3	4	5	4	5	4	10	3	5	7

Add	6	10	7	6	7	From	9	11	12	7	8
and	8	5	3	10	5	take	7	3	8	5	7

10)20(9)36(8)24(9)45(7)28(

ORAL LESSONS.

1. Importance of order in movements and behavior.
2. Cube, sphere, and hemisphere.
3. Sounds differing in length.
4. Pyramid and cone.

TWENTY-EIGHTH WEEK.

Method lightens labor.

1	2	3	4
labor	cylinder	eat	spheroid
work	prism	sleep	oblate
method	lighten	run	prolate
easy	easiest	May	July
easier	play	June	August

TABLES.

7	+	6	=	13		13	−	7	=	6
7	+	7	=	14		14	−	7	=	7
7	+	8	=	15		15	−	7	=	8
7	+	9	=	16		16	−	7	=	9
7	+	10	=	17		17	−	7	=	10

SLATE WORK.

Add	4	3	7	6	5	4	6	2	3	7
and	6	5	7	3	4	3	2	6	7	3
and	4	5	3	6	5	7	8	3	2	7
From	13	17	12	16	11	10	15	13	9	12
subtract	7	10	5	9	3	7	8	6	2	10
Multiply	9	10	7	6	8	9	7	4	9	3
by	5	4	3	4	2	3	2	5	4	8

ORAL LESSONS.

1. Meaning of the motto.
2. Prism and cylinder.
3. Seeds: varieties and uses.
4. Spheroid: oblate and prolate.

TWENTY-NINTH WEEK.

Be just, generous, polite.

1	2	3	4
just	generous	civil	bat
fair	manly	civility	hoop
fairly	noble	rude	marble
justice	polite	rudeness	doll
justly	politeness	rudely	running

TABLES.

2	×	6	=	12		12	÷	2	=	6
2	×	7	=	14		14	÷	2	=	7
2	×	8	=	16		16	÷	2	=	8
2	×	9	=	18		18	÷	2	=	9
2	×	10	=	20		20	÷	2	=	10

SLATE WORK.

Multiply	9	7	10	8	6	5	7	9	8	3
by	5	2	2	3	4	3	1	4	2	9
Add	23	31	45	17	26	42				
and	11	22	31	21	33	43				
From	36	74	28	49	53	67				
take	21	52	16	26	21	64				

ORAL LESSONS.

1. Meaning of justice: how to be just in play.
2. Shape of the earth.
3. Germination shown in corn, beans, acorns, etc.
4. Sounds differing in loudness.

THIRTIETH WEEK.

Defraud not thy neighbor.

1	2	3	4
defraud	robber	sixty	sound
neighbor	axis	seventy	pitch
public	rotate	eighty	September
private	turn	ninety	October
thief	revolve	hundred	November

TABLES.

8	+	6	=	14		14	−	8	=	6
8	+	7	=	15		15	−	8	=	7
8	+	8	=	16		16	−	8	=	8
8	+	9	=	17		17	−	8	=	9
8	+	10	=	18		18	−	8	=	10

SLATE WORK.

Add	27	42	74	86	34	51	32
and	31	23	25	12	44	27	67
From	47	86	25	46	58	37	69
take	27	23	13	31	23	34	21

Multiply	6	8	4	3	5	4	7	9	6	3
by	4	2	5	8	3	3	4	2	5	9

ORAL LESSONS.

1. Wrong of injuring private or public property.
2. Rotation of earth: day and night.
3. Circulation of sap in plants.
4. Sounds differing in pitch.

THIRTY-FIRST WEEK.

Seek for a good name.

1	2	3	4
reputation	wash	obedient	cap
praise	water	respectful	hat
blame	basin	faithful	gloves
commend	soap	studious	mittens
upright	towel	truthful	umbrella

TABLES.

3	×	6	=	18		18	÷	3	=	6
3	×	7	=	21		21	÷	3	=	7
3	×	8	=	24		24	÷	3	=	8
3	×	9	=	27		27	÷	3	=	9
3	×	10	=	30		30	÷	3	=	10

SLATE WORK.

Multiply by	23 × 3	41 × 2	34 × 2	31 × 3	43 × 2	32 × 4
Add and	245 + 323	451 + 527	618 + 361	562 + 327	348 + 621	
From take	785 − 342	697 − 481	876 − 634	654 − 234	795 − 293	

ORAL LESSONS.

1. How a good name may be honestly gained.
2. Personal appearance: hands, face, hair.
3. Sleep and waking of plants.
4. Orderly arrangement of books, toys, clothing, etc.

THIRTY-SECOND WEEK.

Do not bear false witness.

1	2	3	4
shall	walk	rosin	sugar
witness	sail	tar	sirup
false	travel	turpentine	molasses
lying	swim	sprout	gum
shalt	fly	grow	rubber

TABLES.

9	+	6	=	15		15	−	9	=	6
9	+	7	=	16		16	−	9	=	7
9	+	8	=	17		17	−	9	=	8
9	+	9	=	18		18	−	9	=	9
9	+	10	=	19		19	−	9	=	10

SLATE WORK.

Add	74	27	84	6	16	16	26	36
and	63	91	53	8	8	18	18	28
From	647	532	796	981	427	780		
take	317	521	396	901	310	430		
Multiply	42	32	51	42	52	63		
by	2	3	3	4	4	3		

ORAL LESSONS.

1. Meaning of bearing false witness.
2. Systematic distribution of time.
3. Substances made from sap: sugar, rosin, caoutchouc, etc.
4. Short division.

THIRTY-THIRD WEEK.

Avoid that which you blame.

1	2	3	4
talk	high	rose	tulip
talking	deep	pink	crocus
gossip	wide	aster	lilac
story	broad	violet	pansy
stories	thick	daisy	dandelion

TABLES.

4	×	6	=	24		24	÷	4	=	6
4	×	7	=	28		28	÷	4	=	7
4	×	8	=	32		32	÷	4	=	8
4	×	9	=	36		36	÷	4	=	9
4	×	10	=	40		40	÷	4	=	10

SLATE WORK.

Add	837	943	720	435	632
and	321	834	568	22	743
and	530	61	941	880	944

4)36 7)28 4)24 9)36 4)28 8)32

ORAL LESSONS.

1. Evils of tattling, gossip, and slander.
2. How to measure length.
3. Flowers: forms, colors, uses, habits.
4. Meaning of generosity: illustrations.

THIRTY-FOURTH WEEK.

Thou shalt not covet.

1	2	3	4
wish	measure	flowers	petals
desire	length	parts	stamens
covet	breadth	calyx	pistil
make	height	sepals	ovary
earn	depth	corolla	pollen

TABLES.

10	+	6	=	16		16	−	10	=	6
10	+	7	=	17		17	−	10	=	7
10	+	8	=	18		18	−	10	=	8
10	+	9	=	19		19	−	10	=	9
10	+	10	=	20		20	−	10	=	19

SLATE WORK.

Add	2431	6475	5042	7396
and	5342	804	7208	4152
and	4153	7218	970	8291

Multiply	523	644	822	65	78
by	3	2	4	2	3

ORAL LESSONS.

1. Meaning of covet: proper and improper desire.
2. Measures of capacity.
3. Flowers: parts studied and named.
4. How to be polite at home, in school, at play.

THIRTY-FIFTH WEEK.

Small leaks sink ships.

1	2	3	4
ship	inch	filament	pint
boat	foot	anther	quart
schooner	yard	style	bushel
barge	rod	stigma	pound
steamboat	mile	carpel	ounce

TABLES.

5	×	6	=	30		30	÷	5	=	6
5	×	7	=	35		35	÷	5	=	7
5	×	8	=	40		40	÷	5	=	8
5	×	9	=	45		45	÷	5	=	9
5	×	10	=	50		50	÷	5	=	10

SLATE WORK.

Add	6372	7296	5040	4276	1234
and	5493	341	4516	638	5678
and	3141	8009	7293	27	9123

5)455 8)408 7)217 4)248 6)186

ORAL LESSONS.

1. Explain and illustrate the motto.
2. Why we need to measure.
3. Flowers: varieties of inflorescence.
4. Benevolence and kindness the basis of true politeness.

THIRTY-SIXTH WEEK.

Sow as you would reap.

1	2	3	4
move	movement	opposite	Samuel
gently	graceful	alternate	Alice
promptly	meter	whorled	Ellen
quietly	decimeter	Charles	Emma
prompt	centimeter	David	Sarah

TABLES.

6	×	6	=	36	36	÷	6	=	6
6	×	7	=	42	42	÷	6	=	7
6	×	8	=	48	48	÷	6	=	8
6	×	9	=	54	54	÷	6	=	9
6	×	10	=	60	60	÷	6	=	10

SLATE WORK.

Add	243	321	510	423	143
and	312	232	342	234	431
and	521	411	135	313	314

3)72(4)96(2)54(5)365(4)72(

ORAL LESSONS.

1. Movements should be gentle, prompt, quiet, graceful.
2. The meter and its divisions and multiples.
3. Arrangement of leaves: opposite, alternate, whorled.
4. Marking on fences and sidewalks.

THIRTY-SEVENTH WEEK.

Do what you promise.

1	2	3	4
promise	liter	stem	fence
agree	milk	branches	gate
perform	oil	branched	picket
persevere	vinegar	simple	garden
thorough	molasses	divided	orchard

TABLES.

7	×	6	=	42		42	÷	7	=	6
7	×	7	=	49		49	÷	7	=	7
7	×	8	=	56		56	÷	7	=	8
7	×	9	=	63		63	÷	7	=	9
7	×	10	=	70		70	÷	7	=	10

SLATE WORK.

Add	341	462	234	532	643
and	213	321	162	326	526
and	524	205	351	461	350

Multiply	324	241	412	237	261	314
by	7	9	8	7	8	9

ORAL LESSONS.

1. Perseverance: what it is, and its advantages.
2. How to measure capacity.
3. Plant-stems: simple, branched.
4. Throwing stones in streets and public places.

THIRTY-EIGHTH WEEK.

Shun bad company.

1	2	3	4
concert	disturb	erect	climb
lecture	trouble	stand	climbing
crowd	annoy	standing	slender
push	outside	stiff	limber
laugh	without	stout	pliant

TABLES.

8	×	6	=	48		48	÷	8	=	6
8	×	7	=	56		56	÷	8	=	7
8	×	8	=	64		64	÷	8	=	8
8	×	9	=	72		72	÷	8	=	9
8	×	10	=	80		80	÷	8	=	10

SLATE WORK.

Add	5316	2134	3050	4607	1725
and	2471	3507	5734	2051	3612
and	3237	4073	7016	6742	5273

6)372(8)336(7)238(8)264(7)378(

ORAL LESSONS.

1. Behavior in public places.
2. The liter and its divisions and multiples.
3. Plant-stems: erect, prostrate, climbing.
4. Cleanliness of dress and person.

THIRTY-NINTH WEEK.

Respect the aged.

1	2	3	4
sun	above	wind	vine
moon	north-east	twist	grape
stars	north-west	twine	hop
from	south-east	twining	ivy
towards	south-west	tendril	pea

TABLES.

9	×	6	=	54		54	÷	9	=	6
9	×	7	=	63		63	÷	9	=	7
9	×	8	=	72		72	÷	9	=	8
9	×	9	=	81		81	÷	9	=	9
9	×	10	=	90		90	÷	9	=	10

SLATE WORK.

Add	7143	5029	6704	37	27
and	491	47	5093	465	391
and	76	684	8250	7408	6547
Multiply	519	925	2356	872	546
by	6	8	5	7	9

ORAL LESSONS.

1. Deference to authority, and respect for age.
2. Position of the sun at noon: days long, shadows short.
3. How plants climb: bean, pea, ivy.
4. Danger of drinking ice-water when heated.

FORTIETH WEEK.

Resist temptation.

1	2	3	4
sinners	damp	bee	term
entice	wet	wasp	vacation
tempt	chilly	bug	dismiss
consent	wait	moth	good-by
danger	loiter	butterfly	farewell

TABLES.

10	×	6	=	60		60	÷	10	=	6
10	×	7	=	70		70	÷	10	=	7
10	×	8	=	80		80	÷	10	=	8
10	×	9	=	90		90	÷	10	=	9
10	×	10	=	100		100	÷	10	=	10

SLATE WORK.

Add	25342	7843	795	69728
and	36078	72054	6428	479
and	8506	819	53247	8304

7)364 6)252 8)496 9)297

ORAL LESSONS.

1. Explain and enforce the motto.
2. Danger of sitting in a cold draught when heated.
3. How seeds are developed from flowers.
4. How cowardice leads to wrong-doing.

SUGGESTIONS AND MODELS.

TEACHERS in primary schools should be careful not to underestimate the importance of their position. Here children have their first experience of school-life. The impressions made on them here are likely to be lasting. These impressions and experiences should be so pleasant that pupils will learn to love knowledge, and the place and methods of its acquisition. To make them so, a teacher needs wisdom, tact, and patience. From thirty to fifty children, gathered from different homes into one room, depend on her for care, training, occupation, and instruction. She will find use for the highest culture, the most careful thought, and enthusiastic endeavor.

The purpose with reference to which all the exercises should be arranged and shaped is to give the children control of themselves and of the means of communication and culture, and to lead them to acquire useful knowledge.

Children learn by observing and doing, rather than by studying. Reading, writing, drawing, and cipher-ing are arts; and skill in any art is acquired only by careful practice under proper guidance. Habits of quiet movement, correct position, prompt obedience,

neatness, civility, honesty, and truthfulness, imply control of body, attention, and inclination; and these habits are formed not by teaching but by training. Training is addressed to the will through the understanding. Before children are required to take a position, make a sound, arrange blocks, or perform any other exercise, they should be shown by example and directed in words just what to do. Then they must do it carefully, with appropriate criticism and encouragement, and often enough to make its doing easy.

The discipline should be quiet and pleasant in manner, tender and motherly in spirit. It should draw the children in right ways by an attraction which they can neither understand nor resist, rather than drive them by force. But, from the first, children should be trained to habits of prompt, exact, and cheerful obedience.

FIRST WEEK.

Review the Development of Numbers. — It is assumed that the pupils have studied numbers as far as 10 before taking this book, and consequently the lessons for the first two weeks are called reviews. In giving these lessons, use visible objects for illustration. Tangible objects, like pencils, sticks, or kernels of corn, are better than marks or dots, which are perceived only by sight. Next apply the lesson to objects not present, but sufficiently familiar to be readily conceived by the pupil. Lastly, use the ab-

stract numbers. Addition, subtraction, multiplication, and division should not be separately studied at this stage; but all the processes and combinations possible within the limits of a number should be learned before proceeding to the next higher number. Those who have not had opportunity to become familiar with this method of treating numbers may gain an idea of it from the following: —

MODEL LESSON ON 3.

1. *Using Objects.* — How many pencils have I in my left hand? One. How many pencils in my right hand? One. I put that with the other: how many in my left hand now? Two. And how many in my right hand now? One. I put that with the other two: how many pencils in my left hand now? How many times one pencil in three pencils?

I have three pencils in my hand, and take away one pencil: how many pencils remain? I take away one pencil again: how many pencils are left? Again I take away one pencil: how many pencils remain? Out of three pencils how many times can I take one pencil? One pencil is contained in three pencils how many times? Into how many parts can I divide three pencils if I put one pencil in each part? One pencil is a third part of three pencils.

How many pencils in my left hand now? Two. And how many pencils in my right hand? One. Put one pencil with two pencils, and how many pencils are there? From three pencils take away one

pencil: how many remain? Put two pencils with one pencil: how many pencils will there be? From three pencils take away two pencils: how many pencils remain? How many times can I take two pencils out of three pencils? How many times are two pencils contained in three pencils? and how many pencils remain? One pencil is what part of three pencils? Two pencils are what part of three pencils?

2. *Using Conceptions.* — One horse and one horse and one horse are how many horses? Two lamps and one lamp are how many lamps? One wagon and two wagons are how many wagons? Mary had three plums: she gave one to Sarah and one to Ellen. How many plums had she left? John found three apples, and gave two to his mother: how many had he left? One dollar is what part of three dollars? Two peaches are what part of three peaches? How could I divide three cents among two boys? Three times one kitten are how many kittens? If I had three roses, how many times could I give away one rose?

3. *Using Abstract Numbers.* — 1 and 1 and 1 are how many? 2 and 1 are how many? 1 and 2 are how many? 1 from 3 leaves how many? 2 from 3 leaves how many? How many ones in 3? 3 ones are how many? What is one-third of 3? 1 is what part of 3? 2 is what part of 3? How many twos in 3? Take 1, add 1, add 1: how many? Take 2, add 1, take away 2, add 1, add 1: how many? From 3 take 1, take 1, add 2, take away 1, add 1, take away 2, add 1, add 1: how many?

This Book. — An object-lesson, to be followed by directions for preserving the book from defacement and injury, and explanations of the way in which it is to be used.

The aim of object-lessons at this stage should be to cultivate the perceptive and observing faculties, to enlarge the vocabulary, and to communicate useful knowledge. Several excellent treatises on object-lessons, whose titles may be found in the advertising columns of educational journals, are accessible to any who may wish to learn the principles in accordance with which they should be given, or to find methods and models.

Behavior. — This is best taught by the quiet, constant force of example. But, in addition to bringing this force to bear on their pupils, teachers will take advantage of fit occasions furnished by occurrences in school to inculcate by hint, suggestion, question, anecdote, or argument, some principle of morality or rule of politeness. Regular lessons, carefully prepared beforehand, should also be given. Instruction in behavior should be definite and particular. General exhortations to be polite are of little value. Cowdery's "Moral Lessons" and Gow's "Good Morals and Gentle Manners" will be found helpful in teaching these subjects.

THIRD WEEK.

Plants. — The words in the spelling-lessons will furnish hints of what is to be done. The necessary information may be derived from any good text-book of botany; and teachers not familiar with this delightful science will find such books as Wood's "Object-Lessons in Botany" or Miss Youman's "First Lessons in Botany" of much service.

If practicable, the lessons on plants should be given in the open air, and on herbs, shrubs, and trees growing in their natural positions.

Cardinal Points. — This lesson should be given in the open air on or near the 21st of September. Choose a clear day, and take the school, if practicable, to a spot where the horizon, especially towards the east and the west, is visible. Call attention to the sun, the grandest object visible; to its apparent motion and path through the sky; the point where it first appears in the morning, or rises, called *east;* and that where it disappears, or sets, called *west.* Then, as you face the sun at noon, your left hand is toward the east, and your right hand toward the west. The point directly in front of you on the horizon is called *south;* and that directly behind you, *north.*

MODEL.

Look around you and above you, and tell me what is the brightest and most wonderful thing you see. What is there wonderful about it? What does it give us? Can you look at it? Why not? Why is

it not safe to try to look at the sun? Point towards it. Is it always there? Where was it when you first saw it this morning? Where did it seem to come from? What do we say the sun does when it seems to come up from behind the earth? Point to where the sun rises. What do we call the point where the sun rises? What, then, is the east? Point to where the sun seems to go down behind the earth at night. What do we say the sun does then? What do we call the place where the sun sets? What is the west? Stand with your faces toward where the sun is at noon, and stretch out your left hands. Which way do they point? Stretch out your right hands. Which way do they point? Now the point directly before you is called south. Which way are you facing? And the point directly behind you is called north. Towards what point are your backs? North, south, east, and west are called points of the compass, or cardinal points. Name the cardinal points. Point towards the north; towards the east; towards the south; towards the west. If you were in a place where you had never been before, how would you find north?

TENTH WEEK.

Slate Work. — "Add 5 and 2 and 3." Let the result be treated and written as a single expression. Say nothing about "carrying for ten." Continue the same course for the present.

"From 10 take 5." In performing this example

treat the minuend as a single expression, making no distinction between tens and units. In the examples in subtraction given in this book there will be no necessity for the reduction frequently, but improperly, called "borrowing ten." Consequently no attempt should be made to explain it, and no allusion need be made to it.

SIXTEENTH WEEK.

LESSON 3.

This lesson should be given, just before noon on a clear day, as near as practicable to the winter solstice. If the schoolroom has a southerly window, call attention to the slant of the sunshine through it, and to the position and size of the illuminated space on the floor. Mark the edge of the sunshine which is most distant from the window by reference to some fixed object, as a desk, post, or stove, or by driving a nail into the floor. The mark should be a permanent one so that it can be seen and referred to at any time in the course of the year. If you have no window into which the sun shines at noon, take the pupils out of doors, or at least let them look out, and observe the shadow of the schoolhouse, marking its length by some permanent mark which can be recognized without difficulty. Now lead to the observation and inference that the slant of the sunshine and the length of the shadows are due to the low place of the sun in the sky.

Ascertain if the pupils can tell at what points on

the horizon the sun rises and sets at this time of the year. If they cannot, suspend the lesson, and ask them to observe and to report the next day. When they are able to tell, compare these points with those at which the sun rises and sets at the equinox. (See "Suggestions and Models" for Third Week.) Notice that the sun rises and sets far toward the south, and climbs but a little way up in the sky at noon, thus making a comparatively short journey above the horizon.

Now compare the days at this time of the year with those in summer, with reference to the length of daylight before and after school. Finally give the term "solstice," and its derivation, meaning, and application.

SEVENTEENTH WEEK.

LESSON 4.

The essential difference between "long division" and "short division" is not that the divisor is larger in one than in the other, but that in the former the work is completely written out, and in the latter only in part. With equal divisors the abbreviated process involves greater mental effort; for it requires the retention in the mind of the results of the successive steps, which in the complete form are indicated by figures as soon as reached. Hence the complete form should first be taught; and, when pupils have become familiar with this, they should be shown how it can be abbreviated conveniently with small divisors. The error of teaching the abbreviated before

the complete form has doubtless arisen from a misapprehension of the essential difference between the two mentioned above. It would seem to be a sound principle in teaching, and in accordance with the laws of mental development, to teach complete forms first, that the successive steps in the reasoning process may be clearly understood and easily taken; and afterward abbreviated forms, for the sake of convenience and economy.

TWENTY-FIRST WEEK.

LESSON 2.

[For admirable examples of scientific yet simple lessons on lines, angles, plane figures, and solids, see "First Lessons in Geometry," by Rev. Thomas Hill, D.D.]

The things to be learned about lines are grouped in a compact and convenient form in the following synopsis: —

LINES.

1. Definition.
2. Kinds: *a*, straight; *b*, broken; *c*, curved.
3. Relation: *a*, parallel; *b*, inclined; *c*, perpendicular.
4. Position: *a*, horizontal; *b*, vertical; *c*, oblique.

Do not at present attempt to teach the definition of a line. The idea of "length without breadth or thickness" is too abstract for the apprehension of children.

Draw on the board a straight, a broken, and a

curved line. By questions, and not by telling, lead the pupils to compare them with reference to kind or character. Place the tip of a pointer on one end of the straight line and move it along the line to the other end. Compare the direction in which it moves while passing over any one part of the line with that in which it moves while passing over any other part of the line. For how much of its length has this line the same direction?

Statement. — A line which has the same direction through its whole length is a straight line.

Definition. — A straight line is one whose direction is the same throughout.

Trace the broken line with a pointer. Note that the pointer travels in one direction for a while, and then, without being taken from the board, turns, and moves in a different direction; and so on. So this line is made up or formed of different straight lines joined at their ends.

Statement. — A line formed of different straight lines is a broken line.

Definition. — A broken line is a line formed of different straight lines.

By a similar process lead the pupils to see that the other line on the board changes its direction constantly.

Statement. — A line whose direction is constantly changing is a curved line.

Definition. — A curved line is one whose direction is constantly changing.

Draw several lines of different kinds and in various positions, and require the pupils to name them.

Then let them draw different kinds of lines from dictation.

It might add to the interest and so to the effectiveness of this lesson to draw the lines on the floor or on the ground, and let the pupils walk on them, noticing how, in walking along one line or another, they did or did not change their direction.

LESSON 4.

The suggestions for the preceding lesson, in which lines were compared in reference to character, will indicate the methods to be pursued in this, in which lines are to be compared in reference to direction.

Lines which have the same direction are parallel.

Lines which have not the same direction are inclined to each other.

When one line meets another in such a way as to make the difference in direction on one side equal to that on the other, the two lines are perpendicular to each other.

Definitions. — Parallel lines are lines which have the same direction.

Inclined lines are lines which have not the same direction.

Perpendicular lines are lines which differ in direction as much on one side as on the other.

TWENTY-SECOND WEEK.

LESSON 2.

Apparatus. — A vessel of water with a large surface and a plumb-line, which can be made by suspending some heavy body at the end of a string.

Definitions. — A horizontal line is a line parallel to the surface of still water.

A vertical line is one which is perpendicular to the surface of still water.

An oblique line is one which is neither horizontal nor vertical.

Cautions. — Do not allow "straight" or "straight up and down" to be used instead of vertical. Do not use "perpendicular" as synonymous with vertical.

Try to have it clearly understood and vividly apprehended that "an angle is the difference in direction of two lines." Consequently the size of an angle depends, not on the length of the lines by which it is formed, but on the difference of their directions.

TWENTY-FIFTH WEEK.

LESSON 3.

The high rank which hearing holds among the senses indicates that special attention should be given to its culture. Notwithstanding this, however, the cultivation of this sense is almost entirely neglected. To hear well enough to enable one to distinguish articulate words, and so catch the meaning of spoken language, seems to be considered suffi-

cient for all the purposes of life. But, from noises and inarticulate sounds, one whose hearing has been properly cultivated will gain much important, practical information, and derive pure and refining pleasure. Unpleasant and harsh tones in conversation, and inability to sing or to understand or enjoy music, result, in a majority of cases, from the lack of a well-trained ear, rather than from defects in the vocal organs, or from natural inaptitude.

Accustom pupils to listen to the sounds produced by blows on different substances; by carriages, bells, and musical instruments; by winds, waters, and thunder; by insects, birds, and other animals; and especially to their own voices in conversation, reading, or singing. Lead them to compare different sounds, to classify them as pleasing or disagreeable, and to draw inferences from them as to distance and direction; the state of the atmosphere; the material or animal by which the sound is produced; and the feelings indicated by different tones of voice.

Show by examples the difference between a noise and a musical sound.

By experiment show that mere noise is produced by a single blow, or by a series of irregular or infrequent blows, given to the air by the vibration of some solid; and musical sound, by a regular and rapid succession of blows, or by a rapid and regular succession of puffs, causing the air to vibrate.

THIRTY-SECOND WEEK.

SLATE WORK.

Such expressions as "carrying for ten," and "carry the tens to the column of tens," should be avoided. They are misleading. There is no "carrying," or transference, involved in the processes to which such expressions are sometimes applied. The pupils are already familiar with examples in which two figures are required to express the sum of the numbers written in a single column. Consequently, they should readily perform the first four examples given this week. They will add 6 and 8, and write the result, 14, without difficulty. If now in the next example, "add 16 and 8," they add the 8 to the 6 which is written directly above it, and write the result, 14, properly, they will see that the 1 in 14 stands directly below the 1 in 16. They can also see that they have used only 6 of the 16, and that the 10 of the 16 and the 10 of the partial sum 14, represented by the two 1's in the second column, should be added, giving 2 to be written instead of 1 in the result. Having learned this, they will be easily taught to add to the second column the tens found in the sum of the first column without writing the figure which expresses them.

The above suggestions are made on the supposition that the pupils know only so much of Notation and Numeration as may enable them to read "by rote" numbers less than one million. But before this time they may well have learned something of the theory

of Notation, and the names of six or more places. If this should be the case, the explanation of the processes involved in such examples as those given this week will be much more readily apprehended.

THIRTY-THIRD WEEK.

LESSON 2.

The following model lessons on measuring and the measures of the decimal metric system are taken, with slight alterations, from the "Metric Manual for Schools," published by the American Metric Bureau: —

Apparatus. — Some straight sticks, not graduated, cut off square at the ends, and twenty, thirty, or fifty centimeters (eight to twenty inches) long, and some pieces of inelastic cord two or three meters (six to ten feet) long.

Method. — Holding before the pupils a stick of suitable length, proceed substantially as follows: You may look at this stick which I hold in my hand, and tell me something about it. Is it just as long as my desk? Is it longer or shorter than the desk? Is it longer or shorter than one of your desks? Than your slate? Than your Reader? Than this pencil? Than the pointer? Than the blackboard? Than the width of the window?

Now watch me closely, and see just what I do. You see that I put the stick on the edge of the desk, so that one end of it shall come just exactly even with the end. Then I put my pencil close to the

other end of the stick, and keep it in the same place while I move the stick along. I will do this as many times as I can before I come to the other end of the desk; and we will all count how many times I move the stick along. We call this *measuring;* and the stick which we have used is the *measure.* The desk is how many times as long as the stick? What have we been doing? What shall we call the stick we have used?

Here are some sticks of different lengths. Some of the scholars may each take one of these sticks, and measure the width of the desk, then of the doors, windows, etc.; and, after they have done it, some others may take the sticks, and measure; and so on, till we have all learned how to do it.

We have been measuring with these sticks some things that were not very long. Now I would like to measure the length of the schoolroom. Do you think one of these sticks would be a good thing to do it with? Should we have to move it along a great many times? Then do you think it would be better to use a longer measure? Well, we will use this string. James may hold one end of it just in the corner of the room on this side, and William may take the other end, and hold it on the wall, as far as it will reach toward me. Keep it straight, and hold one end just as high as the other. Now move it along exactly one length, and keep doing so till you have measured the whole side of the room. Then two others may take the string, and measure something else.

Now we have learned to measure the length of some things. Next week we will try to learn how to measure something else.

THIRTY-FOURTH WEEK.

LESSON 2.

Apparatus. — A cup or tumbler, some boxes, a basin or pitcher, some grain or dry sand, and some water.

Method. — Name some things which we measured last week. With what did we measure them? What did we learn about them? If we wished to measure water or corn, could we do it with sticks and strings? Why not? What kind of measures must we use for such things? There is some water in this pitcher. Do you know how much? How can we find out how much there is? With what shall we measure it?

One of you may take this cup, and ascertain how much water there is in the pitcher; and we will all count the cupfuls as they are taken out. Now another of you may measure the grain which is in this crayon-box. Use this pen-box as a measure, and we will all count as before.

In our previous lessons we have learned to find out how long a thing is; that is, to measure length. The sticks and strings which we used might be called *measures of length.* We have now learned to measure any thing like water or grain to find out how much there is of it. We may call the cup and the

pen-box which we used for that purpose *measures of capacity.*

You may now try to find out what is the use of measuring, or why we need to measure; and next week we will talk about it.

THIRTY-FIFTH WEEK.

LESSON 2.

We have already learned how to measure some things. Now let us see if we can find out what use there is in measuring.

If I wanted a piece of cloth just large enough to cover the top of my desk, would it be convenient to carry the desk to the store, and have the cloth cut to fit it there? Do you think it would be convenient for the merchant to bring his cloth here, and cut off a piece just large enough? Can you think of a more convenient way? Do you remember that we measured the desk with this stick? How many times as long as the stick is the desk? And the width of the desk is how many times the length of the stick? Then, if I should carry this stick to the store, could I measure off with it a piece of cloth just long enough and just wide enough to cover the desk? Would that be any easier than it would to carry the desk to the store, or bring the cloth here?

Can you tell me how I could pick out at a store some curtains of just the right size for these windows? How?

If you were going to feed a horse with grain, would

it make any difference how much you gave him? How could you measure it so as to know when you were giving him just enough?

Can you name any other cases in which we might need to measure length, height, breadth, or capacity?

THIRTY-SIXTH WEEK.

LESSON 2.

Do you remember what you thought would be a convenient way to let a merchant know just how long and how wide a piece of cloth would be needed to cover this desk? What was it? But suppose I must have the cloth very soon, and so had to send to a distant city for it by telegraph: could I send the stick with which we measured the desk? What could I do then? Could I measure the desk with my hands? I will do it now; and you may count, and tell me how many hand-breadths long the desk is. How many is it? Now, if I should telegraph for a piece of cloth just so many hand-breadths long, do you think it would be of exactly the right length? Why not? Are all people's hands of the same breadth. If the clerk who measured the cloth should have a hand wider or narrower than mine, would he make the cloth of the right length? Is it necessary that the measures used by different people, and in different stores and shops and towns, should be of the same length? Why?

If all the people in the country should agree to use a stick just as long as this (*showing a meter*) in meas-

uring lengths, and should call it a *measure*, would they then understand each other?

If you knew that everybody called a stick as long as this "one measure," and I should tell you that my room at home was five measures long, could you find out, without seeing it, just how long it is?

Do you think all people should use the same kind of measures? Why?

THIRTY-SEVENTH WEEK.

LESSON 2.

Apparatus. — One "school meter" and several metric rules or tapes. It would be well for the teacher to be provided with several meters of different forms, and for each pupil to have a thirty-centimeter desk-rule.

Method. — Can you tell me to-day why the measures which different people use should be of the same length? What advantages would there be in having the same measures used by people of different countries?

Now the people of a great many countries, and a great many people in this country, use a measure just as long as this one which I hold in my hand (*show the clear face*) for a measure of length, and they call it a *meter*. Meter means measure. A gas-meter is a machine for measuring gas. How many of you have ever seen one? What is this? (*pointing to the thermometer.*) What is it for? Then a thermometer is an instrument for measuring heat.

Now remember that meter means measure. Pronounce the word *meter*. Spell it in concert. Write it on your slates three times.

For short distances we need a measure shorter than a meter. Notice how it is made. Do you see these differently colored divisions on this side of the meter? (*Show the face graduated to decimeters.*) Count them. How many are there? Each one of these is a decimeter (*dĕs-ĭ-mēter*). Pronounce it. Spell it. How many decimeters in a meter?

Sometimes we need a measure even shorter than a decimeter. Notice that on this side of the meter (*show the face graduated to centimeters*) each decimeter is divided into parts. Count the parts of one decimeter. How many are there? Each of these ten parts of a decimeter is a centimeter (*sĕn-tĭ-mēter*). Pronounce the word. Spell it in concert. How many centimeters in a decimeter? How many decimeters in a meter?

THIRTY-EIGHTH WEEK.

LESSON 2.

Apparatus. — Liter, deciliter, and centiliter of tin; liter and deciliter of wood; and as many other measures of capacity as can be procured readily.

Method. — For measuring such things as meal, grain, and seed, and all liquids, — as water, milk, oil, or vinegar, — we may use a dish like this (*showing the tin liter*). It is called a liter (*lee-ter*). Pronounce the word. Spell it in concert. It is not necessary to make it of the same shape as this, nor of

the same material; but it must hold just as much as this does. Here is a wooden liter. You see it has not the same shape as the one made of tin. One of you may come here and fill the tin liter with sand, and then pour the sand into the wooden one. You see that the one holds just as much as the other.

If we wished to find out how much water a small bottle would hold, a liter would be too large to measure it in. Then we might use a measure like this, and we call it a deciliter (*dĕs-ĭ-leeter*). Pronounce the word. Spell it in concert. Now one of you may find how many deciliters of sand it will take to fill the liter. How many? How many decimeters are there in a meter? How many deciliters in a liter?

THIRTY-NINTH WEEK.

LESSON 2.

See "Suggestions" for the sixteeenth week. If frequently in the course of the year the attention of pupils is called at noon to the position of the sun, and the length of shadows, they will early gain valuable knowledge, while forming still more valuable habits of observation.

FORTIETH WEEK.

LESSON 4.

Dare to do right! dare to be true!
For you have a work no other can do;
Do it so bravely, so kindly, so well,
Angels will hasten the story to tell.

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